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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
EASTHOM, KARL D	

ART UNIT	PAPER NUMBER
2832	

DATE MAILED: 12/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/656,694	PADMANABHAN ET AL.	
	Examiner	Art Unit	
	Karl D Easthom	2832	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 4-35* is/are pending in the application.

4a) Of the above claim(s) *19-32* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 4-18 and 33-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. Prosecution is hereby reopened with the finality of the last office action removed due to the new are noted below.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 12 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Trademarks are unclear in patent claims since they designate a source of goods and not a clear material.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 4-5, 8, 33 and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Strott et al. Strott discloses the claimed invention at Fig. 1, with independent sensing elements 3, 12, 13 coupled to the front surface of insulating sensor body 4 having connection material 8,9 in a plurality of openings thereof. With the element body being 2, bumps 8,9 extends from front to back, as noted at col. 4, lines 15-23, and lines 60-65. One of the sensors 3 is a heater. The continuous solid body includes portions of 4 below the sensors 2, because the body is flip mounted to an alumina substrate at col. 1, lines 30-36, and col. 2, lines 30-32, with the part 5

away from the alumina substrate. Thus the connection material is configured for connection to a substrate as disclosed at col. 1 of Strott. The device is a physical property sensor sense it senses heat from element 5, and is "for monitoring properties of a fluid", since it can monitor heat from air hitting 5 or the thermistors 12 track ambient, monitoring heat from the fluid of the air or ambient. The thermal conductivity of 2 is low enough to substantially prohibit heat transfer between the plurality of heat sensors, as disclosed at col. 2, lines 34-40, since the thermistor 3 does not transfer heat to the thermistors 12, 13. Note too that the term "substantially" is one of degree as is "low", and moreover, each thermistors obtains its own temperature as noted at col. 5, lines 5-30, so that the sensor body, which is not perfect, does somewhat limit the heat flow. In claim 8, 4 is glass. In claims 2 and 5, the heater can be any of the sensors since resistors must heat. In claim 35, the materials are substantially similar where the term is one of degree. In claim 33, the thermal conductivity is low where the term is one of degree.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 4, 5, 7, 9-10, 14-16, 33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBMTDB (NN79013227) in view of Nagai et al. (J4-83301) or Genova et al. The IBMTDB discloses the claimed invention at the abstract and figure, except the openings and connection material. Nagai discloses vias with connection material at the abstract at Figs. 1-3

as equivalent to leads and used in order to form a connection to a back surface so that such would have been obvious for connection to another surface or substrate, where the IBMTDB discloses a similar sensor and leads. Genova discloses similar connections 28, disclosing at col. 5, lines 1-10 that such connections are desirable to reduce sensor to electronic gaps, and enable high density connections compatible with severe environments rendering the modification obvious. The heater and thermal sensor are noted at Fig. 2, the solid body is the Si-strip. In claims 7,10, Nagai discloses an alumina substrate for a thermal sensor so that it would have been obvious to employ a known substrate to hold a thermal sensor. The Si substrate of the IBMTBD meets claim 9. For claims 4-5 the flow or environment is sensed via thermal sensing. In claims 14-15, there are two materials depicted, the flow channel and the Si strip is a plug. In claim 16, the Si plug is rectangular, but it would have been obvious to render any of a known standard geometrical shape such as a cylinder where Si chips are known to be frequently in cylinder form. In claim 33, "low" is met as the body is lower than some materials. : In claim 35, "substantially similar" is met since the two function together without separation.

8. Claims 1, 4, 5, 7, 10, 33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai et al. (J4-83301) in view of IBMTDB (NN79013227). Nagai discloses the claimed invention, except the plurality of sensors, at Fig. 2, with sensor body 1 having openings and connection material 6, 8. The IBMTDB discloses the plural sensing elements including the heater and thermal sensor as noted above as the typical manner of sensing flow so that same would have been obvious where Nagai discloses a thermal sensor also. In claims 7 and 10, the substrate of Nagai is alumina. Claims 4-5, 33 and 35 follow from remarks above.

9. Claims 1, 4-9, 11-12, 14-16 and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ang et al. in view of Nagai et al. (J4-83301) or Genova et al. The claimed invention is disclosed as noted below, except the openings and connection material. The other elements are disclosed at Ang Figs. 1 and 3 with sensors 18, 20, 22, with 20, 18 a heater, substrate 24, 28 of silicon, epoxy and glass, see col. 2,lines 55-70.. Nagai discloses vias with connection material at the abstract at Figs. 1-3 as equivalent to leads and used in order to form a connection to a back surface so that such would have been obvious for connection to another surface or substrate, where the Ang discloses backside metal on the bottom of substrate 24, further suggesting such a connection. Genova discloses similar connections 28, disclosing at col. 5, lines 1-10 that such connections are desirable to reduce sensor to electronic gaps, and enable high density connections compatible with severe environments rendering the modification obvious. For claim 7, the substrate 32 of Ang is ceramic so that it would have been obvious to employ same so that all materials are the same. In claims 8 and 9, highly melting and insulating are terms of degree deemed met by the materials noted. The glass for claims 6, 8 -9, 11-12, and 34, is the glass noted above, where for claim 6 the glass is photosensitive in that it will heat when light enters same, or the light will bend, etc. Or for the claims 6, 8, 11-12, and 34, it is not clear what the trademarked materials are as noted, but if such trademarks designate the type of glasses claimed, it would have been obvious to employ such a glass since same are so well known as to have a trademark, and glass is disclosed by Ang. See alternatives below. Applicant also admits at page 13 that Pyrex is well known in the art for manufacturing glass components. For claims 14-16, the plug is met by the material 28 where frustoconical is substantially cylindrical for claim 16. See the remarks above for claims 33-35.

10. Claims 13 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBMTDB (NN79013227) or Ang et al. in view of Nagai et al. (J4-83301) or Genova et al, as applied to claims above, further in view of Gerblinger et al. The invention disclosed as noted above except the alumina substrate and platinum sensors. Gerblinger at col. 2 discloses using the materials in order to form a temperature sensor with quick response time sensor similar to the devices of the primary art, which also suggest a need for quick response temperature detectors.

11. Claims 8, 11, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBMTDB (NN79013227) or Ang et al. in view of Nagai et al. (J4-83301) or Genova et al, as applied to claims above, further in view of Kushida The invention disclosed as noted above except here the glasses are disclosed to further provide motivation.. As to the other claims, the quartz substrate 14 is fused silica for claims 8, 11, 34 while the foamed substrate 12 of glass meets the claims as well, suggested for thermal isolation and quick response, so that it would have been obvious to employ glass to protect the sensors. As noted above, the PYREX material is not clear but met as a Corning glass 12.

12. Claims 6, 8, 11-12 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBMTDB (NN79013227) or Ang et al. in view of Nagai et al. (J4-83301) or Genova et al, as applied to claims above, further in view of Morimisa et al. The invention disclosed as noted above except here the photosensitive glass is explicitly suggested and disclosed to further provide motivation. That is, Morimasa discloses photosensitive glass and silica at col. 2 as useful substrate for thermal sensors to provide good response so that it would have been obvious to employ same. Further silica is deemed silica since it is fused to itself to be formed. PYREX

meets the claim since it appears to represent silica to applicant, although this is not clear as noted.

13. Applicant's arguments in the Brief have been considered but are moot or persuasive only as to the removed rejections. Applicant argues Strott "merely describes a "temperature switch". Applicant is incorrect. Strott discloses no switch. Applicant then notes to the contrary, Strott discloses "measuring the temperature/resistance difference between thermistors", Brief at page 7. This much is agreed.

Applicant argues that because the reference describes "monitoring heat or current", it cannot function as a sensor "for monitoring the properties of a fluid". This is not correct. If a device can monitor heat, in can monitor heat from a fluid. Strott clearly discloses measuring the difference between a reference temperature and ambient. That is, col. 2, lines 40-55 discloses that: "This heating cause the first large thermistor to heat up relative to the two smaller thermistors which remain at substantially ambient temperature. This temperature difference which is measured in terms of change in resistance of the thermistors via parameter measurements obtained... correlates to the amount of energy in the analog wire being monitored for prevention against burn out."

A thermistor changes its resistance with temperature. The two smaller thermistors 12, 13, "remain at ambient", as Strott discloses. Thus, when the ambient changes, or a hot air fluid flows past the thermistors, the resistance will be a function of the temperature thereof, that is, the fluid is the ambient. Thus, the Strott device has the ability to determine the temperature of a fluid. When the current through the large thermistor 3 is constant, and the ambient temperature changes, "the temperature difference which is measured" correlates to the ambient temperature,

or the amount of energy in the analog wire. That is, while Strott discloses specifically measuring a change in the energy in the wire, by implicitly holding the ambient temperature constant, implicit or inherent in this, is the fact that when the wire energy is constant, any temperature difference due to a change in the ambient can also be measured. That is, Strott discloses "[measuring] the temperature difference", as noted above. Thus, the device meets the claim limitation of "for monitoring the properties of the fluid". The device need not be specifically disclosed as monitoring the properties of a fluid, since applicant's claim recites an intended use, as long as the Strott device has the ability to monitor a fluid property such as temperature. Finally, the temperature of the Kovar shunt 5 is directly monitored. Since Kovar is highly thermally conductive, a fluid hitting Kovar shunt 5 would transfer heat to same, allowing the temperature of the fluid to be monitored. This would even be more effective if there were no current through the shunt, but even if current flowed through the shunt, air fluid hitting same would cool it off.

Applicant responds to the ability to monitor argument by making three incorrect assertions: 1). If the Examiner's position that layers 2, 4 prohibit heat transfer is correct, then the thermistors cannot be cooled by the ambient and thus monitor temperature changes in the ambient. 2). If one thermistor is a heater, then the other thermistors must be a heater too, and not sensors. 3). The Strott layers cannot prohibit heat transfer between independent sensors.

First, the Examiner' position is that there is no heat transfer between the independent sensing elements, meeting the claim. Applicant's premise in position 1 is a straw man. The examiner does not assert lack of heat transfer from the sensing elements to the ambient. In applicant's claim, "independent sensing elements [include] at least one thermal sensor and at

least one heater". Thus, a heater, according to applicant's claim, is an independent sensing element. As noted above, Strott discloses that the "first large thermistor [3 heats up] relative to the two smaller thermistors [12.13]which remain at substantially ambient temperature". Thus, in Strott, the sensing element 3, the large thermistor, is specifically disclosed as a heater and a thermistor, contradicting applicant' position 2 above. Applicant argues that just because the thermistor heats up, it is not a heater[1]. This is confounding. But moreover, a simple syllogism; all resistors are heaters, all thermistors are resistors, ergo, all thermistors are heaters, see n. 1. As to applicant's position 3, the large thermistor 3 does not transfer heat to the small thermistor sensors 12, 13, because the thermistors 12, 13 remain at ambient temperature, regardless of the temperature of thermistor/heater 3, as Strott makes clear above. This contradicts applicant's position 3

Applicant's arguments are self-contradictory. Applicant argues that the heater/thermistor 3 of Strott heats up due to heat from the current shunt 5 proving heat transfer[2]. Again, applicant confuses the issue of heat transfer, which is asserted by the examiner as lacking between the sensing elements, not as lacking between the shunt and the sensing elements. Applicant's argument proves thermistor 3 is a heater and sensor at the same time, which is of no surprise, as this is the r'asion d'etre for thermistors, see n. 1. To further support his argument that a thermistor must be a heater or a sensor, but not both, Applicant points out that the thermistors of Strott are all made of the same material and resistance, but have different sizes, so that they all must function in the same manner, meaning one cannot be a heater while the

[1] All thermistors are both heaters and sensors. All thermistors are a special class of resistor. By definition, a resistor creates heat, or it is not a resistor. Thus, a thermistor, a special resistor that can sense heat because it changes its resistance as a function of heat, is both a sensor and a heater.

other is a resistor. Hopefully this issue is put to rest above. However, if there is any doubt, please note that applicant's heaters and sensors are all made of the same material too– platinum (specification at page 9, lines 10-15). So applicant argues that his heaters are different from his sensors even though just like those of Strott, they are made of the same material. Applicant's position if true, would mean his claims lack written description and/or enablement, for how can his heaters be distinct from his sensors if they are all made of the same material, he discloses no special technique for obtaining this supposed uncharacteristic quality, and at the same time, argues that the heaters and sensors of Strott must all behave the same if they are of the same material ?

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl D Easthom whose telephone number is (571) 272-1989. The examiner can normally be reached on M-Th, 5:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Karl D Easthom
Primary Examiner
Art Unit 2832

KDE

[2] The shunt 5, being of Kovar and high thermal conductivity, can also transfer heat from the ambient or from a fluid.